FACULTY OF VETERINARY MEDICINE
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Department of Large Animal Internal Medicine

MULTIRESISTANT *MANNHEIMIA HAEMOLYTICA* ISOLATES AS A CAUSE OF THERAPY FAILURE IN BRONCHOPNEUMONIA IN BEEF FARMS

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Introduction

Mannheimia haemolytica is considered the predominant bacterial pathogen associated with infectious bronchopneumonia in cattle, an economically very important disease worldwide. Infectious bronchopneumonia is the main indication for antimicrobial use in calves. Therefore, it receives considerable attention in countries where current antimicrobial use in food animals is questioned. With exception of the veal industry, available reports on respiratory pathogens in beef cattle show relatively low resistance levels.

Aim

This study describes the involvement of multiresistant *M. haemolytica* isolates as a cause of unresponsive treatment in 11 outbreaks of infectious bronchopneumonia in beef cattle.

Material and Methods

- Period: February 2016-February 2018
- Study group: 11 different beef herds
- Cases: clinical signs and lung consolidation on thoracic ultrasonography
- Sample: non-endoscopic broncho-alveolar lavage (nBAL)
- Identification: MALDI-TOF MS
- Susceptibility testing: MIC-gradient strip test, disk diffusion (clinical breakpoints according to CLSI, 2018)

Results

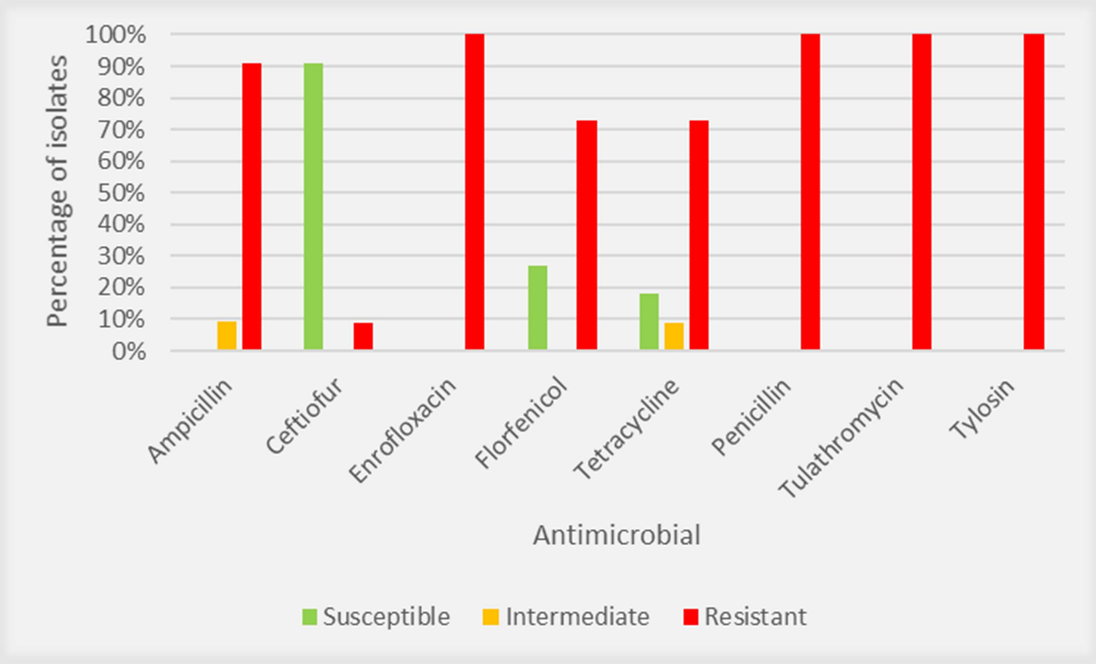

Figure 1: Susceptibility testing results for *M. haemolytica* isolates

In all cases, *M. haemolytica* was abundantly present on culture from nBAL samples. All isolates were resistant for a minimum of 2 antimicrobial classes (Figure 1). Antimicrobial resistance was present for 2, 3, 4 and 5 antimicrobial classes in 9%, 36%, 46% and 9% of the isolates, respectively. Susceptibility for ceftiofur was present in all the cases, except one. All isolates might be susceptible for amoxicillin-clavulanic acid (MIC-values ≤ 1 / 0,5µg/mL) and resistant for doxycycline (MIC-values ≥8µg/mL), although no clinical breakpoints are available for these antimicrobials. Five calves, who were treated with 5-8 different antimicrobials, died due to therapy failure. Six calves recovered from their pneumonia due to treatment with ceftiofur or amoxicillin-clavulanic acid, based on the antimicrobial susceptibility test results.

Conclusion

These findings illustrate the presence of multiresistant, clinically relevant *M. haemolytica* isolates in beef herds in Belgium. This can result in unresponsive treatment and death. These cases stress the utmost importance of sampling at an early stage of an outbreak of infectious bronchopneumonia, and immediately adapting therapy to effective antimicrobials, based on antimicrobial susceptibility test results.

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